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PTO/SB/21 (08-03)

Approved for use through 08/30/2003. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	10/709,054	
	Filing Date	04/09/2004	
	First Named Inventor	SHAO-KANG CHANG	
	Art Unit		
	Examiner Name		
Total Number of Pages in This Submission	20	Attorney Docket Number	NTCP0019USA

ENCLOSURES (Check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> After Allowance communication to Technology Center (TC)
<input type="checkbox"/> Fee Attached	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input type="checkbox"/> Amendment/Reply	<input type="checkbox"/> Petition	<input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Power of Attorney, Revocation	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Change of Correspondence Address	<input type="checkbox"/> Other Enclosure(s) (please identify below):
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Terminal Disclaimer	
<input checked="" type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Request for Refund	
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> CD, Number of CD(s) _____	
<input type="checkbox"/> Response to Missing Parts/Incomplete Application	Remarks	
<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Winston Hsu, Reg. No.: 41,526
Signature	<i>Winston Hsu</i>
Date	7/5/2004

CERTIFICATE OF TRANSMISSION/MAILING			
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.			
Typed or printed name			
Signature		Date	

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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PTO/SB/17 (10-03)
Approved for use through 07/31/2006. OMB 0651-0032
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FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 0.00

Complete if Known

Application Number	10/709,054
Filing Date	04/09/2004
First Named Inventor	SHAO-KANG CHANG
Examiner Name	
Art Unit	
Attorney Docket No.	NTCP0019USA

METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit
Account
Number
Deposit
Account
Name

50-3105

North America Intellectual Property Corp.

The Director is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) (\$) 0.00

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent Claims	-20** =	X	
Multiple Dependent	-3** =	X	

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 0.00

**or number previously paid, if greater, For Reissues, see above

3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify)

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$) 0.00

SUBMITTED BY

(Complete (if applicable))

Name (Print/Type)	Winston Hsu	Registration No. (Attorney/Agent)	41,526	Telephone	886289237350
Signature		Date	7/5/2004		

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

5 Applicant: Shao-Kang Chang
 Graham Chuang
 Yi-Nan Chen

 Filing Date: 04/09/2004

 Appl. No.: 10/709,054

 Docket No.: NTCP00019USA

10

 Title: ETCHANT COMPOSITION FOR SEM IMAGE ENHANCEMENT
 OF P-N JUNCTION CONTRAST

15 To: Commissioner for Patents
 P.O. BOX 1450
 Alexandria, VA 22313-1450

 Subject: Information Disclosure Statement under 37 CFR §1.56.

20

 Dear Sir/Madam:

 This is an Information Disclosure Statement in accordance with the duty to
25 disclose information material to patentability under 37 CFR §1.56. The applicants
 wish to make of record the document listed on the accompanying form PTO/SB/08. It
 is respectfully requested that the examiner initials the cited reference on the form and
 that it be made of record in the application and that a copy of the initialed form be sent
 to the applicants with the next communication from the examiner.

30

 Since the IDS is filed before the mailing date of a first Office action on the merits,
 a petition to request consideration of the information disclosure statement is hereby

requested according to 37 CFR §1.97(b). The prior art patent contained in the information disclosure statement was cited in communications from the Taiwan Intellectual Property Office on May 11, 2004 for a counterpart foreign application. Since this IDS is being submitted within three months of the date in which this prior art patent was first cited, the applicants sincerely hope that the examiner can consider the item contained in this IDS.

According to the requirement set forth in 37 CFR §1.98 and MPEP 609 (Rev.1, Feb. 2000), the applicants are submitting a copy of Taiwan Patent No. 304901 filed 08/16/1996 and a concise explanation of the relevance to this application hereinafter. For convenience, claim 1 of the present application is appended at the end of this IDS.

Taiwan Patent No. 304901 discloses cleaning solution for cleaning semiconductor device and cleaning method using the cleaning solution. The cleaning solution is composed of ammonia (NH_4OH), methanol (CH_3OH), hydrofluoric acid (HF) and deionized water (H_2O). The cleaning solution can be manufactured by simply mixing the respective compositions. The cleaning solution can strip polymers and particles within a short time, without etching or damaging the cleaned metal layers. The mixture ratio of the cleaning solution $\text{NH}_4\text{OH}:\text{CH}_3\text{OH}:\text{DI-H}_2\text{O}$ by volume is 1:1-50:0.1-50. The volume of HF is 1-10,000 ppm with respect to the mixture solution of NH_4OH , CH_3OH and $\text{DI-H}_2\text{O}$.

FIG. 1 of the prior art patent shows the corrosion depending on the added amount of HF in the case when the semiconductor substrate having metal layers formed thereon is cleaned with the cleaning solution made of the mixture solution of NH_4OH , CH_3OH and $\text{DI-H}_2\text{O}$ in the volume ratio of 1:10:1 and 500-30,000 ppm of HF added thereto. In FIG. 1, the X-axis represents the added amount of HF and the Y-axis represents the corrosion depth of the metal layers. The corrosion depth of the metal layers increases until the added HF reaches about 600-700 ppm, but gradually decreases thereafter. If the added amount of HF exceeds about 2,000 ppm, the corrosion depth of the metal layers becomes almost zero. In light of the above, the claimed invention of the present application entitled "Etchant Composition For SEM


Image Enhancement Of P-N Junction Contrast” is significantly different from the prior art as disclosed in Taiwan Patent No. 304901.

5 Present application claim 1:

1. (Original) An etchant composition comprising:
an NTC-1 solution prepared by mixing solution “A” comprising an organic acid,
HF, and nitric acid with a 49% HF solution; and
10 an NTC-2 solution comprising metal ions and a strong oxidant;
wherein said NTC-1 solution and said NTC-2 solution are mixed together at a
specific volume ratio.

15

Respectfully Submitted,

20  Date: 7/5/2004
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